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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/849,691	05/04/2001	Alexander Tetelbaum	00-653	8190

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EXAMINER

STEVENS, THOMAS H

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/849,691	<b>Applicant(s)</b> TETELBAUM, ALEXANDER	
	<b>Examiner</b> Thomas H. Stevens	<b>Art Unit</b> 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. Claims 1-14 were examined.

***Section I: Non-Final Rejection (4<sup>th</sup> Office Action)***

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-14 are rejected under 35 U.S.C. 102(b) as being disclosed by Sarrafzadeh et al. ("Single-Layer Global Routing" IEEE 1994) (hereafter Sarrafzadeh). Sarrafzadeh discloses an algorithm to negate the single-Layer global routing problem (abstract).

Claim 1. A method of forming a congestion map (pg. 40, left column, Density Algorithm, 1<sup>st</sup> paragraph) by calculating a probability that a wire path in a predetermined direction will be contained in a given area within a datapath, said method comprising: dividing the datapath into pre-determined areas to define said given area, calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of full segments in the pre-determined direction for said given area in said datapath; calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph)

expectations of partial in the pre-determined direction for said given area in said datapath; summing the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations which have been calculated to determine the probability that a wire path in the pre-determined direction will be contained in the given area within the datapath; and entering the probability on the congestion map (pg. 40, left column, Density Algorithm, 1<sup>st</sup> paragraph).

Claim 2. A method as recited in claim 1, further comprising calculating the probability for each connection in the datapath.

Claim 3. A method as recited in claim 2, further comprising summing the probabilities to calculate the whole mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectation of segments in the pre-determined direction in the given area for all the connections in the datapath.

Claim 4. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of full horizontal segments (pg.4, left column, 2nd paragraph) for said given area in said datapath.

Claim 5. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph)

expectations of partial horizontal segments (pg.4, left column,2nd paragraph) for said given area in said datapath.

Claim 6. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial horizontal segments (pg.4, left column,2nd paragraph) for said given area in said datapath, and calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial horizontal segments (pg.4, left column,2nd paragraph) for said given area in said datapath.

Claim 7. A method as recited in claim 6, further comprising summing the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations which have been calculated to determine the probability that a wire path in the horizontal direction (pg.4, left column,2nd paragraph; and pg.44, left column, 1st paragraph with figure 14) will be contained in the given area within the datapath.

Claim 8. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of full vertical segments (pg.4, left column,2nd paragraph) for said given area in said datapath.

Claim 9. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial vertical segments (pg.4, left column, 2nd paragraph) for said given area in said datapath.

Claim 10. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of full vertical segments (pg.4, left column, 2nd paragraph) for said given area in said datapath, and calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial vertical segments (pg.4, left column, 2nd paragraph) for said given area in said datapaths.

Claim 11. A method as recited in claim 10, further comprising summing the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations which have been calculated to determine the probability that a wire path in the vertical direction (pg.4, left column, 2nd paragraph; and pg.44, left column, 1st paragraph with figure 14) will be contained in the given area within the datapath.

Claim 12. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph)

expectations of full horizontal segments (pg.4, left column,2nd paragraph) for said given area in said datapath and calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of full vertical segments (pg.4, left column,2nd paragraph) for said given area in said datapath.

Claim 13. A method as recited in claim 12, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial horizontal segments (pg.4, left column,2nd paragraph) for said given area in said datapath and calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial vertical segments (pg.4, left column,2nd paragraph) for said given area in said datapath.

Claim 14. A method as recited in claim 1, further comprising calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of full horizontal segments (pg.4, left column,2nd paragraph) for said given area in said datapath, calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial horizontal segments (pg.4, left column,2nd paragraph) for said given area in said datapath, summing the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations relating to horizontal segments (pg.4, left column,2nd paragraph) which have been calculated to determine the probability

that a wire path in the horizontal direction (pg.4, left column,2nd paragraph; and pg.44, left column, 1st paragraph with figure 14) will be contained in the given area within the datapath, calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of full vertical segments (pg.4, left column,2nd paragraph) for said given area in said datapath, calculating the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations of partial vertical segments (pg.4, left column,2nd paragraph) for said given area in said datapath, and summing the mathematical (density algorithm: pg.41, right column, section IV, 1st paragraph) expectations relating to vertical segments (pg.4, left column,2nd paragraph) which have been calculated to determine the probability that a wire path in the vertical direction (pg.4, left column,2nd paragraph; and pg.44, left column, 1st paragraph with figure 14) will be contained in the given area within the datapath.

## ***Section II: Response to Arguments***

### ***37 C.F.R. § 1.131***

4. Applicants are thanked for addressing this. The declaration filed on 1/21/05 under 37 CFR 1.131 is sufficient to overcome the Lou et al. ("Estimating Routing Congestion Using Probabilistic Analysis", Proceedings of the 2001 International Symposium on Physical Design) reference.

Applicant's arguments, see pg.1, filed 8/17/05, with respect to the rejection of all claims have been fully considered and are persuasive. Therefore,



Art Unit: 2123

the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made in view of Sarrafzadeh.

***Citation of Relevant Prior Art***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,442,745 Arunachalam et al.

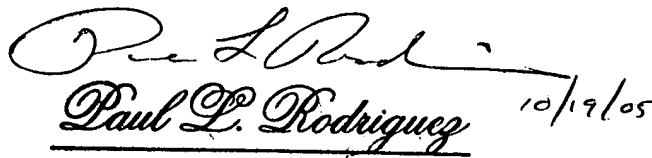
***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (8:00 am- 4:30 pm EST).

If attempts to reach the examiner by telephone are unsuccessful, please contact examiner's supervisor, Mr. Leo Picard ((571) 272-3749). The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) (toll-free (866-217-9197)).

October 18, 2005

  
Paul L. Rodriguez 10/19/05  
Primary Examiner  
Art Unit 2125

TS